

Claims

- [c1] 1. A biologically pure culture of one or more microorganisms, and mutants thereof having all of the identifying characteristics of said microorganisms, wherein said microorganisms are capable of degrading nitrogenous material said microorganisms being selected from the group consisting of, Rhizobium rhizogenes (ATCC PTA-4110), Burkholderia sp. (ATCC PTA-4111), Cladosporium cladosporioides (ATCC 66669), and mixtures thereof.
- [c2] 2. The culture of Claim 1 wherein said nitrogenous material is 1,3,5-trinitro-1,3,5-triazine (RDX).
- [c3] 3. The culture of Claim 1 wherein said microorganism is Rhizobium rhizogenes (ATCC PTA-4110).
- [c4] 4. The culture of Claim 1 wherein said microorganism is Burkholderia sp. (ATCC PTA-4111).
- [c5] 5. The culture of Claim 1 wherein said microorganism is Cladosporium cladosporioides (ATCC 66669).
- [c6] 6. A biologically pure culture of Rhizobium rhizogenes (ATCC PTA-4110), and mutants thereof having all of the identifying characteristics of said strain, wherein said strain is capable of degrading 1,3,5-trinitro-1,3,5-triazine (RDX).
- [c7] 7. A biologically pure culture of Burkholeria sp. (ATCC PTA-4111), and mutants thereof having all of the identifying characteristics of said strain, wherein said strain is capable of degrading 1,3,5-trinitro-1,3,5-triazine (RDX).
- [c8] 8. A biologically pure culture of Cladosporium cladosporioides (ATCC 66669), and mutants thereof having all of the identifying characteristics of said strain, wherein said strain is capable of degrading 1,3,5-trinitro-1,3,5-triazine (RDX).
- [c9] 9. A method for the bioremedial treatment of an environment contaminated with one or more nitrogenous materials comprising the steps of
a) adding to the environment an effective amount of the degrading culture of claim 1 forming a mixture and

b) maintaining the mixture under conditions appropriate for degradation of the contaminant to allow the nitrogenous materials present in the environment to be consumed.

[c10] 10. The method of claim 9 wherein said contaminated environment is contaminated soil or water.

[c11] 11. The method of claim 9 wherein said nitrogenous material is 1,3,5-trinitro-1,3,5-triazine (RDX).

[c12] 12. The method of claim 9 wherein the step of maintaining the mixture under conditions appropriate for degradation of the contaminant includes adding a carbon source to the mixture.

[c13] 13. The method of claim 12 wherein said carbon source is selected from the group consisting of sucrose, glucose, glycerol, arabinose, mannose, mannitol, maltose, N-acetyl glucosamine and other sugars.

[c14] 14. A device comprising a nitrogenous energetic material selected from the group consisting of explosive materials, propellant materials, and combinations thereof, wherein said nitrogenous energetic material is capable of self-remediation, if the energetic material is not detonated or consumed as intended, said device comprising:

a.a housing defining the exterior of said device;

b. a quantity of an energetic material housed within said shell, said quantity of said energetic material being so configured as to be detonatable to cause the intended effect of said explosive or propulsion device;

c.a quantity of at least one type of microorganism capable of bioremediating said energetic material, said quantity of microorganism being housed within said housing in such proximity to said quantity of said energetic material that, if said quantity of energetic material fails to detonate as intended, the microorganisms in said quantity of microorganism deactivate said device by commencing bioremediation of said quantity of energetic material.

[c15] 15. The device of claim 14, wherein said at least one type of microorganism is selected from a group of microorganisms consisting of Rhizobium rhizogenes

Burkholderia sp. Cladosporium cladosporioides, and mixtures. 16. The device of claim 14, wherein said microorganism is selected from a group of microorganisms consisting of the microorganism identified at the American Type Culture Collection by ATCC Designation No. ATCC PTA-4110, ATCC PTA-4111, ATCC 66669, and mixtures thereof.